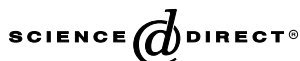




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## Hydrodynamically interacting droplets at small Reynolds numbers

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### Abstract

Droplets moving at close distances interact hydrodynamically. We present the experimental and theoretical results of a study for monodisperse 73  $\mu\text{m}$  geometric diameter droplets with initial velocities between 1.5 and 3 m/s and variable generation rate (ranging from 125 to 2000  $\text{s}^{-1}$ ) emitted horizontally and vertically. During the decelerated motion the droplet Reynolds number varied between the value  $<1$  and 10. The hydrodynamic interaction depends on the spatial distance, and we observed a considerable increase of the droplet trajectory endpoints with increasing generation rate.

Reviewing the various approaches for the description of hydrodynamic interactions, we adapted a theory for a stationary Stokes flow past a linear array of spheres and found a surprisingly good agreement between our experiments and the above model. Even better agreement was obtained by additionally taking the Basset force into account.

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